

A Novel, Portable, Projection, Focusing Schlieren System, Phase II

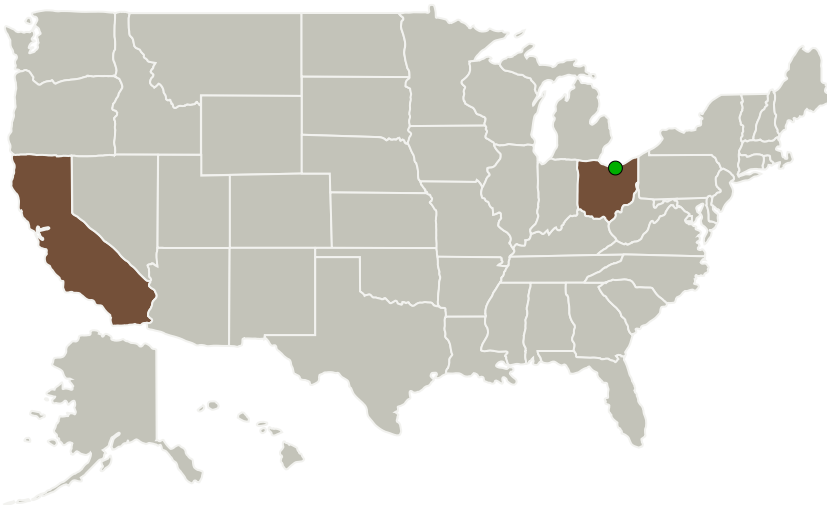
Completed Technology Project (2011 - 2013)



Project Introduction

The schlieren technique has been used for flow diagnostics in wind tunnels since the beginning of aerospace research due to its ability to make airflows – especially shock waves and turbulence – visible. This proposal describes a novel type of schlieren system that would increase efficiency, capability, and productivity for ground test facilities. The concept and the availability of state-of-the-art components make the system more portable, easier to align, and more versatile than existing systems. A major drawback of current schlieren systems, and one that has restricted their widespread commercial use, is that they require exact alignment between a pair of widely separated mirrors or grids, which takes time and limits portability, and costs are prohibitive for most such applications. This problem is partially relaxed by focusing schlieren methods. The proposed concept incorporates features of existing schlieren systems while removing the primary limitations. All of the elements that require precise alignment are contained within a camera body and can be relatively inexpensive. Very large fields of view are made possible. This is advantageous in wind tunnel facilities, since experiments are frequently installed only to be torn down shortly afterwards.

Primary U.S. Work Locations and Key Partners



A Novel, Portable, Projection,
Focusing Schlieren System,
Phase II

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

A Novel, Portable, Projection, Focusing Schlieren System, Phase II



Completed Technology Project (2011 - 2013)

Organizations Performing Work	Role	Type	Location
MetroLaser, Inc.	Lead Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Laguna Hills, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

California	Ohio
------------	------

Project Transitions

▶ **June 2011:** Project Start

✓ **May 2013:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138634>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MetroLaser, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

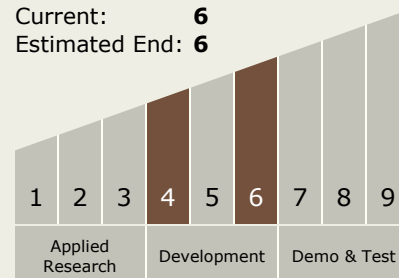
Carlos Torrez

Principal Investigator:

Drew L'esperance

Technology Maturity (TRL)

Start: 4
Current: 6
Estimated End: 6



A Novel, Portable, Projection, Focusing Schlieren System, Phase II

Completed Technology Project (2011 - 2013)



Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
 - └ TX13.2 Test and Qualification
 - └ TX13.2.1 Mechanical/Structural Integrity Testing

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System